



Attorney Docket No.: PATENT
AHA-02101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Technology Center 2600

In re Application of:

Eric John Hewitt et al.

Serial No.: 09/808,884

Filed: 03/14/01

For: **ENHANCED TURBO PRODUCT
CODES**

) Group Art Unit: 2621

) Examiner:

) TRANSMITTAL LETTER

) 260 Sheridan Avenue, Suite 420
) Palo Alto, California 94306
) (650)833-0160

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Enclosed please find an Information Disclosure Statement and Form PTO-1449, including copies of the references contained thereon, for filing in the U.S. Patent and Trademark Office.

The Commissioner is hereby authorized to charge any additional fee or credit overpayment to our Deposit Account No. 08-1275. **An originally executed duplicate of this transmittal is enclosed for this purpose.**

Respectfully submitted,
HAVERSTOCK & OWENS LLP

Dated: 6-19-01

By: Thomas B. Haverstock
Thomas B. Haverstock
Reg. No.: 32,571
Attorneys for Applicants

CERTIFICATE OF MAILING (37 CFR § 1.8(a))

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

HAVERSTOCK & OWENS LLP,

Dated: 6-20-01 By: C. L. Gray



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Sir:

The citations listed below, copies attached, may be material to the examination of the above-identified application, and are therefore submitted in compliance with the duty of disclosure defined in 37 C.F.R. " 1.56 and 1.97. The Examiner is requested to make these citations of official record in this application.

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HAVERSTOCK & OWENS LLP,

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Applicants have become aware of the following printed publications which may be material to the examination of this application:

- U. S. Patent 4,845,714;
- U.S. Patent 5,406,570;
- U.S. Patent 5,446,747;
- U.S. Patent 5,499,254;
- U.S. Patent 5,563,897;
- U.S. Patent 5,566,191;
- U.S. Patent 5,684,811;
- U.S. Patent 5,703,911;
- U.S. Patent 5,719,884;
- U.S. Patent 5,721,745;
- U.S. Patent 5,721,746;
- U.S. Patent 5,729,560;
- U.S. Patent 5,761,248;
- U.S. Patent 5,787,127;
- U.S. Patent 5,787,239;
- U.S. Patent 5,802,116;
- U.S. Patent 5,841,818;
- U.S. Patent 5,901,182;
- U.S. Patent 5,907,582;
- U.S. Patent 5,930,272;
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- R. Pyndiah et al., "Performance of Block Turbo Coded 16-QAM and 64-QAM Modulations," IEEE, 1995, pp. 1039-1043;
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- J. Cheng & R. McEliece, "Frequency-Efficient Coding with Low-Density Generator Matrices," Aug. 1997 draft, (presented in part: Oct. 1996 at 34th Allerton Conference on Communications, Control, and Computing, Monticello, Illinois; and 1997 IEEE International Symposium on Information Theory, Ulm, Germany, July 1997), pp. 1-30;
- S. Dolinar et al., "Code Performance as a Function of Block Size," TMO Progress Report 42-133, May 1998, pp. 1-23;
- D. Divsalar & F. Pollara, "Multiple Turbo Codes for Deep-Space Communications," TDA Progress Report 42-121, May 1995, pp. 66-77;
- D. Divsalar & F. Pollara, "Turbo Codes for Deep-Space Communications," TDA Progress Report 42-120, Feb. 1995, pp. 29-39;
- D. Divsalar & F. Pollara, "On the Design of Turbo Codes," TDA Progress Report 42-123, Nov. 1995, pp. 99-121;

- G. Battail et al., "Pseudo-Random Recursive Convolutional Coding For Near-Capacity Performance," IEEE, 1993, pp. 23-27;
- M. Moher, "Decoding Via Cross-Entropy Minimization," IEEE, 1993, pp. 809-813;
- S. Benedetto et al., "Soft-Output Decoding Algorithms for Continuous Decoding of Parallel Concatenated Convolutional Codes," IEEE, 1996, pp. 112-117;
- P. Hoeher, "Advances in Soft-Output Decoding," IEEE, 1993, pp. 793-797;
- C. Berrou et al., "A Low Complexity Soft-Output Viterbi Decoder Architecture," IEEE, 1993, pp. 737-740;
- J. Hagenauer, "Decoding of Binary Codes with Analog Networks," ITW, Feb. 1998, pp. 13-14;
- N. Seshadri & P. Hoeher, "On Post-Decision Symbol-Reliability Generation," IEEE, 1993, pp. 741-745;
- D. Costello Jr. & H. Cabral, "The Effect of Turbo Codes on Figure 1," ITW, Feb. 1998, pp. 41-42;
- D. Divsalar & F. Pollara, "Turbo Codes for PCS Applications," (no date or publisher listed);
- C. Berrou et al., "An IC for Turbo-Codes Encoding and Decoding," IEEE, 1995, pp. 90-91;

- A. J. Viterbi et al., "Perspectives on Interleaved Concatenated Codes with Iterative Soft-Output;
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- C. Wang, "Asymptotic Performances of Nonrepetitive & Repetitive Turbo Codes," IEEE, 1997, pp. 1-6;
- A. Hunt and S. Crozier, "Hyper-Codes: High-Performance Low-Complexity Error-Correcting Codes," (no date or publisher listed);
- C. Wang, "On the Performance of Turbo Codes," IEEE, 1998, pp. 987-992;
- S. Benedetto et al, "Analysis, Design, and Iterative Decoding of Double Serially Concatenated Codes with Interleavers," IEEE Journal on Selected Areas in Communications, Vol. 16, No. 2, Feb. 1998, pp. 231-244;
- O. Acikel & W. Ryan, "Punctured Turbo Codes for BPSK/QPSK Channels," (no publisher listed), Mar. 1999, pp. 1-30;
- O. Acikel, "Implementation Issues for High Rate Turbo Codes on BPSK/QPSK Channels," (no publisher listed), Mar. 1999, pp. 1-12;
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- P. Adde et al., "Design and performance of a product code turbo encoding-decoding prototype," pp. 214-219. Ann Telecommun., Vol. S4, No. 3-4, 1999;
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IEEE 1989 pp. 1680-1686; and
- C. Berrou, "Near Optimum Error Correcting Coding and Decoding: Turbo-Codes," IEEE,
Vol. 44, No. 10, Oct. 1996, pp. 1261-1271;

This Information Disclosure Statement under 37 C.F.R. " 1.56 and 1.97 is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that anyone or more of these citations constitutes prior art.

Respectfully submitted,
HAVERSTOCK & OWENS LLP

Dated: 6-19-01

By: 
Thomas B. Haverstock
Reg. No.: 32,571

Attorneys for Applicants

FORM PTO-1449
(Modified)U.S. Department of Commerce
Patent and Trademark Office

Attorney Docket No.: AHA-02101

Serial No.: 09/808,884

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**SUPPLEMENTAL
INFORMATION DISCLOSURE STATEMENT BY APPLICANT**
(Use Several Sheets If Necessary)

Applicant: Eric John Hewitt et al.

Filing Date: March 14, 2001

Technology Center 2600

(37 CFR § 1.98(b))

U.S. PATENT DOCUMENTS

Examiner Initials		Serial / Patent Number	Issue Date	Applicant / Patentee	Class	Subclass	Filing Date
	AA	4,845,714	7/04/89	Zook	371	50	6/08/87
	AB	5,406,570	4/11/95	Berrou et al.	371	43	4/16/92
	AC	5,446,747	8/29/95	Berrou	371	45	4/16/92
	AD	5,499,254	3/12/96	Ikekawa et al.	371	43	8/31/94
	AE	5,563,897	10/08/96	Pyndiah et al.	371	37.4	11/18/94
	AT	5,566,191	10/15/96	Ohnishi et al.	371	43	5/07/93
	AF	5,684,811	11/04/97	Doran	371	43	9/01/95
	AG	5,703,911	12/30/97	Lin et al.	375	341	8/17/95
	AH	5,719,884	2/17/98	Roth et al.	371	37.4	7/27/95
	AI	5,721,745	2/24/98	Hladik et al.	371	43	4/19/96
	AJ	5,721,746	2/24/98	Hladik et al.	371	43	4/19/96
	AK	5,729,560	3/17/98	Hagenauer et al.	371	43.1	6/12/96
	AL	5,761,248	6/02/98	Hagenauer et al.	375	340	7/19/96
	AM	5,787,127	7/28/98	Ono et al.	375	341	7/22/96
	AN	5,787,239	7/28/98	Horie et al.	395	114	7/17/96
	AO	5,802,116	9/01/98	Baker et al.	375	341	4/04/96
	AP	5,841,818	11/24/98	Lin et al.	375	341	1/17/96
	AQ	5,901,182	5/04/99	Kot	375	341	3/26/97
	AR	5,907,582	5/25/99	Yi	375	259	8/11/97
	AS	5,930,272	7/27/99	Thesling	371	37.01	6/10/97
	AT	6,145,111	11/07/00	Crozier et al.	714	755	8/14/98
	AU						

FOREIGN PATENTS OR PUBLISHED FOREIGN PATENT APPLICATIONS

		Document Number	Publication Date	Country / Patent Office	Class	Subclass	Translation	
							Yes	No
	AA	0 625 829 A2	11/23/94	EP	H03M	13/00		X
	AB							

OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)

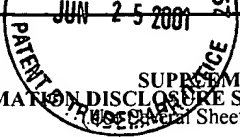
	AA	R. Pyndiah et al., "Performance of Block Turbo Coded 16-QAM and 64-QAM Modulations," IEEE, 1995, pp. 1039-1043.
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	AC	R. Pyndiah, "Near-Optimum Decoding of Product Codes: Block Turbo Codes," IEEE Transactions on Communications, Vol. 46, No. 8, Aug. 1998, pp. 1003-1010.

Examiner:

Date Considered:

EXAMINER:

Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO-1449 (Modified)		U.S. Department of Commerce Patent and Trademark Office		Attorney Docket No.: AHA-02101	Serial No.: 09/808,884
 <p>SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use Only for Sheets If Necessary)</p> <p>(37 CFR § 1.98(b))</p>		Applicant: Eric John Hewitt et al.		JUN 26 2001	
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	AD	J. Cheng & R. McEliece, "Frequency-Efficient Coding with Low-Density Generator Matrices," Aug. 1997 draft, (presented in part: October 1996 at 34th Allerton Conference on Communications, Control, and Computing, Monticello, Illinois; and 1997 IEEE International Symposium on Information Theory, Ulm, Germany, July 1997), pp. 1-30.			
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	AJ	M. Moher, "Decoding Via Cross-Entropy Minimization," IEEE, 1993, pp. 809-813.			
	AK	S. Benedetto et al., "Soft-Output Decoding Algorithms for Continuous Decoding of Parallel Concatenated Convolutional Codes," IEEE, 1996, pp. 112-117.			
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[illegible]